特种计算机

Industrial Computer

产品说明书

User Manual

EC3-1816CLD2NA

Cedar Trail + NM10 3.5寸主板

Cedar Trail+NM10 3.5-inch Motherboard

版本：B00

Legal Information

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Hotline: 4008809666

About this manual

Scope of the Manual

The manual is appropriate for EVOC EC3-1816CLD2NA.

Convention

The term “the PC” or “the Product” within the manual usually stands for EVOC EC3-1816CLD2NA.

Instructions

Safety instructions

To avoid property losses or individual injury, please pay attention to the safety instructions within the manual. The warnings within the manual are marked with warning triangle ⚠, whose existence is dependent upon the scale of the potential hazard.

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1. Product Introduction

1.1 Overview

This motherboard contains Intel® Atom™D2550/N2600 + NM10 chipset (EC3-1816CLD2NA-D2550 contains Intel® Atom™ D2550 + NM10 chipset, EC3-1816CLD2NA-N2600 contains Intel® Atom™ N2600 + NM10 chipset), D2550 is 1M Cache 1.86GHz，N2600 is 1M Cache 1.6GHz；supports onboard 2GB DDR3 memory (EC3-1816CLD2NA-D2550 motherboard supports onboard 1066MHz 2GB memory; EC3-1816CLD2NA-N2600 motherboard supports onboard 800MHz 2GB memory). The motherboard supports VGA and LVDS displays, single or dual-display, and onboard two 10/100/1000Mbps network ports.

This board provides multiple external ports, including two SATA interfaces (optional), one CF card (optional), six USB 2.0 ports, four COM ports (COM1 supports RS-232/RS-485), and standard MIC-IN/LINE-IN/LINE-OUT audio ports; one Mini PCIE port.

1.2 Mechanical Dimensions, Weight and Environment

- Dimensions: 146.1mm(L) x 101.6mm(W) x 38.6mm(H)
- Net weight:0.19Kg;
- Operating environment:

  EC3-1816CLD2NA-D2550:

  Temperature: -20℃～60℃

  Humidity: 5 %～95% (non-condensing)

  EC3-1816CLD2NA-N2600:

  Temperature: -20℃～70℃

  Humidity: 5%～95% (non-condensing)

- Storage environment:

  Temperature: -40℃～80℃

  Humidity: 5%～95% (non-condensing)

1.3 Typical Consumption

The typical consumption is calculated based on the following configuration under idle status.

EC3-1816CLD2NA-N2600

CPU：Onboard Intel® Atom ™ CPU N2600 @ 1.60GHz

Memory: Onboard Samsung/DDRIII 1066/2G

- +12V@0.68A；+5%/-3%；

EC3-1816CLD2NA-D2550

CPU：Onboard Intel® Atom ™ CPU D2550 @ 1.86GHz

Memory: Onboard Samsung/DDRIII 1066/2G

- +12V@0.9A；+5%/-3%；

1.4 Microprocessor

Onboard Intel® Atom™ D2550 (dual-core)/N2600 (dual-core) processor,

Micro-FCBGA11 package.

1.5 Chipset

Intel® ATOM™ D2550/N2600 + NM10.

1.6 System Memory

Onboard 2GB DDR3 memory, EC3-1816CLD2NA-D2550 supports 1066MHz memory; EC3-1816CLD2NA-N2600 supports 800MHz memory.

1.7 Display

- Supports VGA and LVDS display; VGA supports hot swap; all are sync output;

- The maximum resolution and refresh rate supported by VGA is 1920×1200@60Hz, and that supported by LVDS is 1920×1080@60HZ.

1.8 Network

Provides two 10/100/1000Mbps network ports; LAN1 supports Wake-On-LAN.

1.9 Audio

HDA standard, supporting MIC-IN/LINE-IN/LINE-OUT.

1.10 Power Feature

Single 12V power supply.

1.11 Watchdog

- 255 levels, programmable by minute or second;
- Supports watchdog timeout interrupt or reset system.

1.12 Operating System

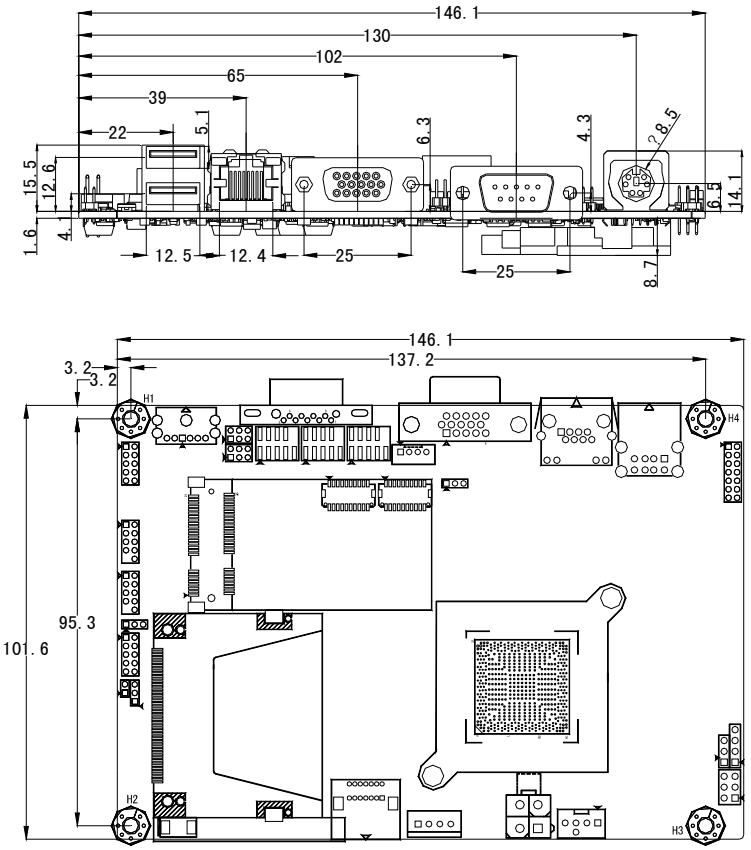
Supported operating systems: WINCE/WINXP/WINXPE/WIN7/Linux

1.13 I/O Ports

- 4 x COM port; COM1 supports RS-232/RS-485 mode selection;
- 1 x CF card slot (optional);
- 2 x SATA2.0 interface (optional), supporting hot swap;
- 6 x USB2.0 port;
- 1 x PS/2 keyboard/mouse port;
- 1 x 8-channel digital I/O port.

2. Installation Instructions

2.1 Product Dimensions Drawing

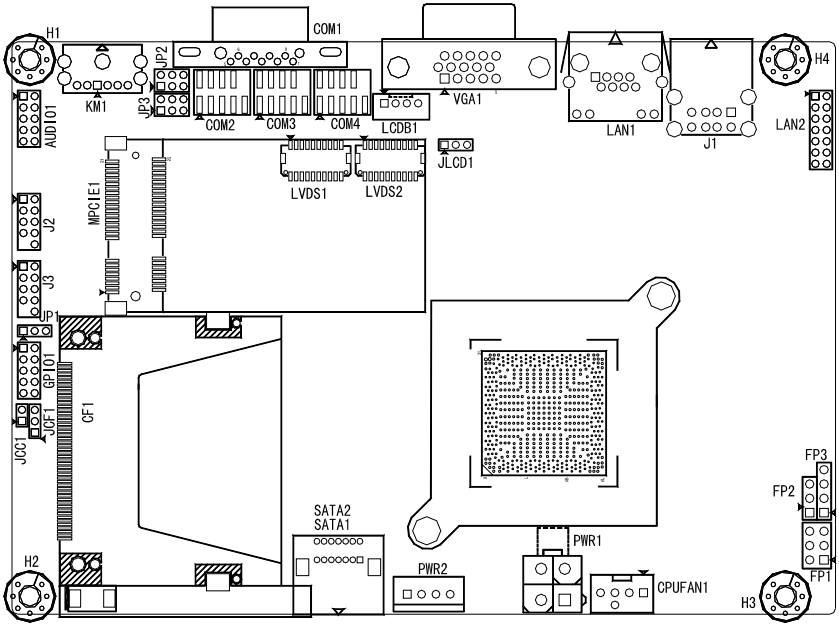


Unit: mm

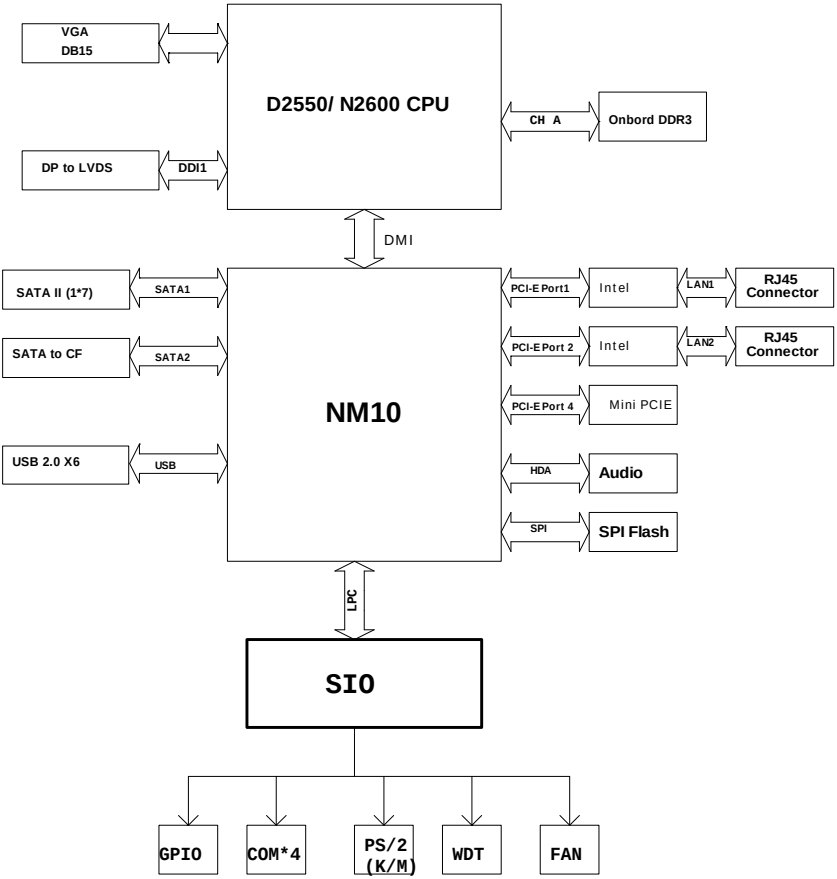
Warning!

Please adopt appropriate screws and proper installation methods (including board allocation, CPU and heat sink installation, etc); otherwise, the board may be damaged. It is recommended to use M3x6 GB9074.4-88 screws at H1 ~ H4.

2.2 Port Location



2.3 Structure Diagram



Tip: How to identify the first pin of the jumpers and connectors

1. Observe the letter beside the socket: the first pin is usually marked with "1" or bold lines or triangular symbols;
2. Observe the solder pad on the back: usually the square pad is the first pin.

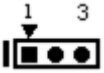
2.4 Jumper Setting

1. JCC1: Clear/Keep CMOS Setting (Pitch: 2.0mm)

CMOS is powered by the button battery on board. Clearing CMOS will restore original settings (factory default). The steps are listed as follows: (1) Turn off the computer and unplug the power cable; (2) Instantly short circuit JCC1; (3) Turn on the computer; (4) Follow the prompt on screen to enter BIOS setup when booting the computer, load optimized defaults; (5) Save and exit. Please set as follows:

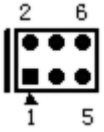
	Setup	Function
JCC1	1-2 Open	Normal ((Default)
	1-2 Short	Clear the contents of CMOS and all BIOS settings will restore to factory default values.

2. JP1: AT/ATX Power-on Mode Selection (Pitch: 2.0mm)

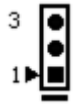
	Setup	Function
 JP1	1-2 Open	AT power-on mode
	2-3 Short	ATX power-on mode (Default)

3. JP2～JP3: COM1 RS-232/ RS-485 Mode selection (Pitch: 2.0mm)

COM1 supports two operating modes: RS-232/RS-485. The mode selection can be realized by setting JP2/JP3.

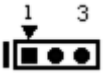
	Pin Setting	Mode Selection	
		RS-232 （Default）	RS-485
 JP2, JP3	JP2	1-2	3-4
	JP3	1-3 2-4	3-5 4-6

4. JCF1: CF Card Operating Voltage Selection (Pitch: 2.0mm)

	Setup	Function
 JCF1	1-2 Short	+3.3V
	2-3 Short	+5V（Default）

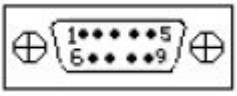
5. JLCD1: Select LCD Operating Voltage (Pitch: 2.0mm)

Different LCD screens have different voltages; the board provides two voltage options, +3.3V and +5V. Only when the selected LCD voltage is in accord with the LCD screen operating voltage in use, can the LCD screen operate normally. Please set as follows:

	Setup	Function
 JLCD1	1-2 Short	+3.3V(Default)
	2-3 Short	+5V

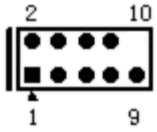
2.5 COM Port

1. The board provides one DB9 COM port. The COM1 supports RS-232/RS-485.

	Pin	Signal	
		RS-232	RS-485
 COM1	1	DCD#	Data-
	2	RXD	Data+
	3	TXD	NC
	4	DTR#	NC
	5	GND	GND
	6	DSR#	NC
	7	RTS#	NC
	8	CTS#	NC
	9	RI#	NC

Note: Under RS-485 mode, the data transmission direction is controlled automatically.

2. This motherboard provides three 2×5Pin COM ports (pitch: 2.0mm). Their pin definitions are as follows:

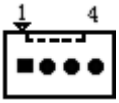


COM2～COM4

Pin	Signal	Pin	Signal
1	DCD#	2	RXD
3	TXD	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	NA

2.6 LCD Backlight Control Connector

This board provides one 1×4Pin wafer LCD backlight control connector (pitch: 2.0mm). Its pin definitions are as follows:



LCDB1

Pin	Signal
1	VCC_LCDBKLT
2	LCD_BKLTCTL
3	LCD_BKLTEN
4	GND

Notes:

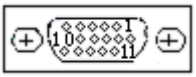
VCC_LCDBKLT--- backlight power (+12V); the current should be limited below 1A.

LCD_BKLTCTL--- backlight control (The signal is output directly from CPU, and is PWM signal; voltage amplitude 0V—3.3V, duty cycle is within 0-100%);

LCD_BKLTEN --- backlight enabling signal, active high. (The signal is output directly from CPU, CMOS output, voltage amplitude 0V-3.3V.)

2.7 Display Port

1. This motherboard provides one standard DB15 VGA port. Its pin definitions are as follows:

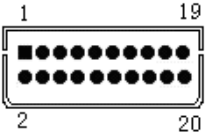


VGA1

Pin	Signal	Pin	Signal
1	Red	2	Green
3	Blue	4	NC
5	GND	6	GND
7	GND	8	GND
9	NC	10	GND
11	NC	12	DDCDATA
13	HSYNC	14	VSYNC
15	DDCCLK		

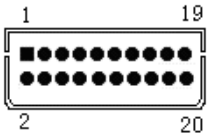
2. LVDS port

This board provides one dual-channel 24bitLVDS port (LVDS1, LVDS2; pitch: 1.0mm). If single-channel 18-bit/24-bit LVDS screen is used, LVDS data cable must be connected to LVDS1. The pin definitions of dual-channel 24-bit LVDS are as follows:



LVDS1

Pin	Signal	Pin	Signal
1	LVDSO_D0+	2	LVDSO_D0-
3	GND	4	GND
5	LVDSO_D1+	6	LVDSO_D1-
7	GND	8	GND
9	LVDSO_D2+	10	LVDSO_D2-
11	GND	12	GND
13	LVDSO_CLK	14	LVDSO_CL
15	GND	16	GND
17	LVDSO_D3+	18	LVDSO_D3-
19	VDD	20	VDD



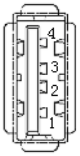
LVDS2

Pin	Signal	Pin	Signal
1	LVDSE_D0+	2	LVDSE_D0-
3	GND	4	GND
5	LVDSE_D1+	6	LVDSE_D1-
7	GND	8	GND
9	LVDSE_D2+	10	LVDSE_D2-
11	GND	12	GND
13	LVDSE_CLK	14	LVDSE_CLK
15	GND	16	GND
17	LVDSE_D3+	18	LVDSE_D3-
19	VDD	20	VDD

Note: LVDSOx refers to the odd lines of dual-scan PANEL, and LVDSEx refers to the even lines of dual-scan PANEL. The model of LVDS socket used by this motherboard is DF20G-20DP-1V, and the recommended corresponding terminal is DF20A-20DF-1C.

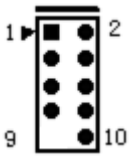
2.8 USB Port

This board provides one dual-USB port connector (J1) and two 2x5Pin USB ports (J2, J3, pitch: 2.0mm), supporting six USB devices. Their pin definitions are as follows:



J1（USB）

Pin	Signal
1	+5V
2	USB_Data-
3	USB_Data+
4	GND

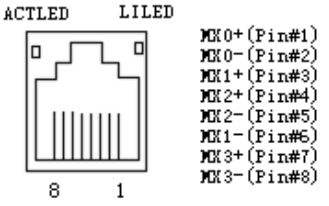


J2、J3

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB1_Data-	4	USB2_Data-
5	USB1_Data+	6	USB2_Data+
7	GND	8	GND
9	NA	10	GND

2.9 LAN Port

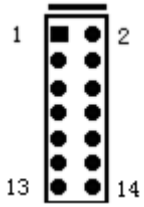
The motherboard provides two 10/100/1000Mbps LAN ports: one is a RJ45 connector LAN1, the other is a 2×7 pin header (LAN2, pitch: 2.0mm).



LAN1

ACTLED (Single color: green)	LAN Activity Status Indicator		LILED (Dual-Color: orange/green)	LAN Speed Indicator
			Green	1000Mbps
Flash	Data being transmitted		Orange	100Mbps
Off	No Data being transmitted		Off	10Mbps

Note: no matter the Gigabit LAN card contains Link signal or not, the ACTLED on the left always indicates the data transmission status. When data is being transmitted, the green LED on the left is “flashing”; when it is connected to network with no data transmission, the green LED is “off”; when there are broadcasting packages, it is normal if the ACTLED is “flashing”.

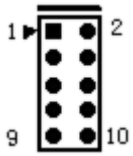


LAN2

Pin	Signal	Pin	Signal
1	MX0+	2	MX0-
3	MX1+	4	MX1-
5	MX2+	6	MX2-
7	MX3+	8	MX3-
9	GND	10	GND
11	LINK1000-	12	LINK100-
13	ACT_LED+	14	ACT_LED-

2.10 Audio Port

This board provides one 2×5Pin audio port (pitch: 2.0mm).

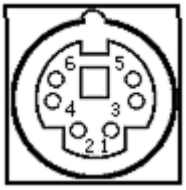


AUDIO1

Pin	Signal	Pin	Signal
1	LOUT_R	2	LOUT_L
3	GND_AUDIO	4	GND_AUDIO
5	LIN_R	6	LIN_L
7	GND_AUDIO	8	GND_AUDIO
9	MIC_L	10	MIC_R

2.11 Mouse/Keyboard Port

This board provides one Mini DIN 1-to-2 PS/2 port.

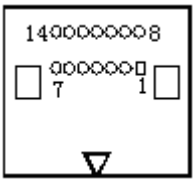


KM1

Pin	Signal
1	KB_DATA
2	MS_DATA
3	GND
4	+5V
5	KB_CLK
6	MS_CLK

2.12 SATA Interface

This motherboard provides one double-layer SATA interface. SATA2 is optional, and the selection method can be set in BIOS SETUP. Please refer to BIOS Setup part for detailed information.



SATA1/SATA2

Pin	Signal	Pin	Signal
1	GND	8	GND
2	TX1+	9	TX2+
3	TX1-	10	TX2-
4	GND	11	GND
5	RX1-	12	RX2-
6	RX1+	13	RX2+
7	GND	14	GND

2.13 SATA HDD Hot Plugging

Notes for hot-swap of SATA hard disk:

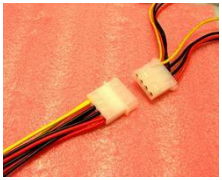
1. The hard disk shall support SATA 2.0 and use 15-pin SATA hard disk power connector.
2. The driver of chipset shall support the hot-swap of SATA hard disk.
3. Hot-swap of SATA hard disk where the operating system is located is forbidden when system is powered-on.

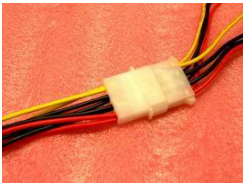
SATA Data Cable

SATA Power Cable

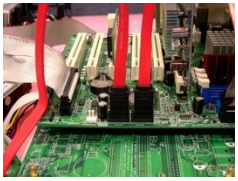
Please carry out hot plugging as follows. Improper operation may destroy the hard disk or result in data loss.

SATA HDD Hot Plugging Steps





Step 1: Please connect the 1 x 4 pin SATA power connector (white) with the 1x4-pin power cable of power adapter.



Step 2: Please connect the SATA data cable to the SATA connector on the motherboard.

Step 3: Please connect the 15-pin SATA power connector (black) to the SATA hard disk.

Step 4: Please connect the SATA data cable to the SATA hard disk.

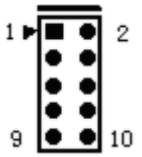
SATA HDD Hot Unplugging Steps

Step 1: Uninstall the hard disk from the device manager.

Step 2: Unplug the data cable from the SATA hard disk.

Step 3: Unplug the SATA 15-pin power connector (black) from the SATA hard disk.

2.14 GPIO Port



GPIO1

(Pitch: 2.0mm)

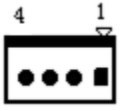
Pin	Signal	Pin	Signal
1	GPIO1	2	GPIO5
3	GPIO2	4	GPIO6
5	GPIO3	6	GPIO7
7	GPIO4	8	GPIO8
9	GND	10	NC

Note: By the factory default, the pin 1, 3, 5 and 7 of the connector are TTL input while pin 2, 4, 6, and 8 are CMOS output. The factory default state is high level and the voltage range for input/output signal is 0-5V.

2.15 Fan Connector

The motherboard provides one 1×4Pin CPU fan connector (CPUFAN1, pitch: 2.54mm). When using the fan connector, please pay attention to the following two issues:

- The current for the fan should be no more than 500mA (12v).
- Please confirm that the fan cable complies with the socket cable. Power cable (usually red) is in the middle. In addition, please confirm the position of earth cable (usually black) and fan speed output pulse signal cable (other colors). Some fans have no speed detection while the output of the cable is up to 12V. These substandard connection will damage the CPU card. It is recommended to use a fan with speed detection.
- Adjust the fan's airflow to the direction of heat venting.



CPUFAN1

Pin	Signal
1	GND
2	+12V
3	FAN_IO
4	FAN_PWM

FAN_IO: fan speed pulse output; FAN_PWM: fan speed PWM control.

2.16 Power Connector

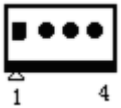
1. AT power connector, single 12V power connector (pitch: 4.2mm)

PWR1

Pin	Signal
1	GND
2	GND
3	+12V
4	+12V

2. SATA power connector

Wafer 1x4P power connector (white, pitch: 2.54mm)



PWR2

Pin	Signal
1	+12V
2	GND
3	GND
4	+5V

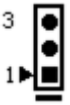
2.17 Status Indicating and Control Connectors

1. Power switch and HDD indicator ports (Pitch: 2.54mm)

FP1

Pin	Signal	Pin	Signal
1	PWRBTN#	2	GND
3	GND	4	RESET#
5	HDD_LED-	6	HDD_LED+

2. Power indicator port (Pitch: 2.54mm)



FP2

Pin	Signal
1	PWR_LED+
2	NC
3	GND

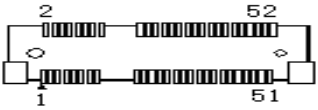
3. Speaker output port (Pitch: 2.54mm)

FP3

Pin	Signal
1	SPEAKER
2	NC
3	GND
4	+5V

2.18 Mini-PCIe Port

This board provides one Mini-PCIe slot, which supports WiFi wireless network card.



MPCIE1 (on the back side of the board)

Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	REFCLK-	12	NC
13	REFCLK+	14	NC
15	GND	16	NC
17	Reserved	18	GND
19	Reserved	20	W_DISABLE#
21	GND	22	PERST#
23	PERn0	24	+3.3V
25	PERp0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	GND
35	GND	36	NC

37	GND	38	NC
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	Reserved	46	NC
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3VSB

2.19 CF Card (optional)

This motherboard provides CF card (optional), which can be set in the BIOS SETUP. Please refer to BIOS Setup part for detailed information.

CF card is a sort of high speed memory, small in size and easy to use. The storage capacity varies with different cards in use, such as 128M, 256M. CF card could only be inserted in one direction and it is marked as CF1 on the back of the board.

Pin	Signal	Pin	Signal
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS0#	32	CS1#
8	GND	33	VS1#
9	ATASEL#	34	IOR#
10	GND	35	IOW#
11	GND	36	WE#
12	GND	37	IRQ

13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	VS2#
16	GND	41	RESET#
17	GND	42	IORDY
18	A2	43	DREQ
19	A1	44	DACK#
20	A0	45	DASP#
21	D0	46	ATA66_DET
22	D1	47	D8
23	D2	48	D9
24	WP/IOCS16#	49	D10
25	CD2#	50	GND

3. BIOS Setup

3.1 UEFI Overview

UEFI (Unified Extensible Firmware Interface) is the latest computer firmware to replace traditional BIOS. UEFI is solidified in the flash memory on the CPU board. Its main functions include: initialize system hardware, set the operating status of the system components, adjust the operating parameters of the system components, diagnose the functions of the system components and report failures, provide hardware operating and controlling interface for the upper level software system, guide operating system and so on. UEFI provides users with a human-computer interface in menu style to facilitate the configuration of system parameters for users, control power management mode and adjust the resource distribution of system device, etc.

Setting the parameters of the UEFI correctly could enable the system operating stably and reliably; it could also improve the overall performance of the system at the same time. Inadequate even incorrect UEFI parameter setting will decrease the system operating capability and make the system operating unstably even unable to operate normally.

3.2 UEFI Parameter Setup

Prompt message for UEFI setting may appear once powering on the system. At that time (invalid at other time), press the key specified in the prompt message (usually <Del> or <F2>) to enter UEFI setting.

All the setup values modified by UEFI (excluding data and time) are saved in the flash storage in system; the contents will not be lost even if powered down or remove the battery of the board. The data and time are saved in CMOS storage, which is powered by battery; unless clearing CMOS is executed, its contents would not be lost even if powered off.

Note! UEFI setting will influence the computer performance directly. Setting parameter improperly will cause damage to the computer; it may even be unable to power on. Please use the internal default value of UEFI to restore the system.

Our company is constantly researching and updating UEFI, its setup interface may be a bit different. The figure below is for reference only; it may be different from your UEFI setting in use.

3.3 Basic Function Setting for UEFI

After starting SETUP program, the main interface of Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc. will appear:

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc. Copyright(C)	
Main Advanced Chipset Boot Security Save & Exit	
Motherboard Information	Set the Date. Use'Tab' to switch between Date elements.
Project Name EC3-1816CLD2NA	
BIOS Name P9173000	
BIOS Version A00	
Build Date 12/05/2012 10:10:10	→←：Select Screen
	↑↓：Select Item
Power Supply	Enter：Select
Power Type ATX	+/-：Change Opt
	F1：General Help
System Date [Mon 11/01/2009]	F2：Previous Values
System Time [00:47:55]	F3：Optimized Defaults
	F4：Save ESC：Exit
Access Level Administrator	
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

◆ **Main**

➢ **System Date**

Choose this option and set the current date by < + > / < - >, which is displayed in format of month/date/year. Reasonable range for each option is: Month (1-12), Date (01-31), Year (Maximum to 2099), Week (Mon. ~ Sun.).

➢ **System Time**

Choose this option and set the current time by < + > / < - >, which is displayed in format of hour/minute/second. Reasonable range for each option is: Hour (00-23), Minute (00-59), Second (00-59).

◆ **Advanced**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Main **Advanced** Chipset Boot Security Save & Exit	
WARNING: Setting wrong values in below sections may cause system to malfunction! ▶ OEM Features Setting ▶ CPU Configuration ▶ IDE Configuration ▶ USB Configuration ▶ Super IO Configuration ▶ H/W Monitor ▶ PPM Configuration ▶ Clock Generator Configuration	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

➢ **OEM Features Setting**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Some features only for the board SATA Port Mode as [SATA Device] DP-to-LVDS Panel Type [800x600/18/Single] LVDS BackLight Value 128	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

- **SATA Port Mode**

  To select whether SATA port is SATA device or CF card.

- **DP-to-LVDS Panel Type**

Used to select resolution of onboard LVDS screen.

- **LVDS BackLight Value**

  Used to select backlight brightness.

➢ **CPU Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
CPU Configuration	→←：Select Screen
	↑↓：Select Item
Processor Type Intel(R) Atom(TM) i5 CPU	Enter：Select
EMT64 Supported	+/-：Change Opt
Processor Speed 1600 MHz	F1：General Help
System Bus Speed 400 MHz	F2：Previous Values
Ratio Status 16	F3：Optimized Defaults
Actual Ratio 16	F4：Save
System Bus Speed 400 MHz	ESC：Exit
Processor Stepping 30661	
Microcode Revision 266	
L1 Cache RAM 2x56 k	
L2 Cache RAM 2x512 k	
Processor Core Dual	
Hyper-Threading Supported	
Hyper-threading [Enabled]	
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

Display the relevant information of CPU. Note: the Type, Speed, Core and HT of the CPU are related to the CPU installed in the platform; different series of CPUs will display different information.

- **Hyper-Threading**

  Control switch of the Hyper Threading Technology.

➢ **IDE Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
SATA Port0 Not Present SATA Port1 Not Present SATA Controller(S) [Enabled] Configure SATA as [IDE]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

SATA Port0 ~ 5 dynamically detect whether there are SATA devices on motherboard. If devices are connected with the corresponding ports, then it will display the SATA device type. Otherwise, it will display "Not Present".

- **SATA Controller(S)**

  The SATA controller is used to enable or disable the device on SATA Port.

- **Configure SATA as**

  Configure the SATA device type: IDE or AHCI.

➢ **USB Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
USB Configuration USB Devices: 1 Keyboard，1 Mouse, 2 Hubs Legacy USB Support [Enabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

- **Legacy USB Support**

This option is used to support legacy USB devices (keyboard, mouse, storage device, etc). When it is set to Enabled, the USB devices can be used in the OS that does not support USB, such as DOS. When it is set to Disabled, the legacy devices cannot be used in the OS that does not support USB.

Note: USB can be used in EFI application, such as in Shell.

➢ **Super IO Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Super IO Configuration ►Serial Port 0 Configuration ►Serial Port 1 Configuration ►Serial Port 2 Configuration ►Serial Port 3 Configuration	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

- **Serial Port 0～3 Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.		
Advanced		
Serial Port 0～3 Configuration		→←：Select Screen ↑↓：Select Item
Serial Port	[Enabled]	Enter：Select
Device Settings	IO=3F8h; IRQ=4;	+/-：Change Opt F1：General Help
Change Settings	[Auto]	F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.		

*** Serial Port0 ~ 3**

This option is used to enabled or disable the current serial port.

*** Device Settings**

This option is used to display the current resource configuration of the serial port.

*** Change Settings**

This option is used to configure the resources (IO and IRQ) used by the serial port.

- **H/W Monitor**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.		
Advanced		
PC Health Status		→←：Select Screen
System Temperature	: +26 C	↑↓：Select Item
CPU Temperature	: +57 C	Enter：Select
CpuFan Speed	：N/A	+/-：Change Opt
Vcore	: +1.152 V	F1：General Help
V3.3	: +3.328 V	F2：Previous Values
V5.0	: +5.058 V	F3：Optimized Defaults
V12.0	: +12.091 V	F4：Save
VBAT	: +3.296 V	ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.		

Display the currently detected hardware monitoring information, such as voltage, temperature, fan speed, etc.

- **System Temperature**

  Current system temperature, monitored by the thermal resistor on motherboard.

- **CPU Temperature**

  Current CPU temperature, monitored by the temperature sensor on motherboard.

- **CpuFan Speed**

  Current CPU fan speed.

- **Vcore**

  CPU core voltage.

- **V3.3/ V5.0/V12.0**

  Turn on/off the power to output voltage.

- **VBAT**

  CMOS battery voltage.

➢ **PPM Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
PPM Configuration EIST [Enabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2008,American Megatrends, Inc.	

- **EIST**

It is the CPU frequency adjustable function of Intel.

➢ **Clock Generator Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Advanced	
Clock Generator Configuration Spread Spectrum [Disabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

- Spread Spectrum

This option is used to control the spread spectrum function of the clock signal.

◆ **Chipset**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Main Advanced **Chipset** Boot Security Save & Exit	
▶ Host Bridge ▶ South Bridge	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

➢ **Host Bridge**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Chipset	
▶ Intel IGD Configuration ******* Memory Information ********** Memory Frequency 800 MHz(DDR3) Total Memory 1024 MB DIMM#0 Not Present DIMM#1 1024 MB	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2008,American Megatrends, Inc.	

➢ **Intel IGD Configuration**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Chipset	
Intel IGD Configuration IGFX – Boot Type [VBIOS Default] Fixed Graphics Memory Size [128MB]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2008,American Megatrends, Inc.	

- **IGFX – Boot Type Low**

  Set the primary display device booted by IGD.

- **Fixed Graphics Memory Size**

  Set the graphics memory size.

➢ **South Bridge**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Chipset	
▶ TPT Devices ▶ PCI Express Root Port 0 ▶ PCI Express Root Port 1 ▶ PCI Express Root Port 2 ▶ PCI Express Root Port 3 Restore AC Power Loss [Last State]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

- **Restore AC Power Loss**

  "Restore on AC Power Loss" option controls how the PC will behave once power is restored following a power outage.

  * Power Off

    S5 status, power on manually after restoring AC power.

  * Power On

    S0 status, automatically power on after restoring AC power.

  * Last State

    The "Last State" option returns the PC to the state in effect at the time the power outage or shutdown occurred. If the computer is powered-on (S0 status) when the power outage or shutdown occurred, then the computer will automatically power on after restoring AC power; if the computer is powered off (S5 status) when the power outage or shutdown occurred, then the computer will not automatically power on after restoring AC power (remaining S5 status).

- **TPT Devices**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Chipset	
Azalia Controller [HD Audio] Select USB Mode [By Controllers] UHCI #1 (ports 0 and 1) [Enabled] UHCI #2 (ports 2 and 3) [Enabled] UHCI #3 (ports 4 and 5) [Enabled] UHCI #4 (ports 6 and 7) [Enabled] USB 2.0(EHCI) Support [Enabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

* Azalia Controller

  This option is used to enable or disable the audio card controller.

* Select USB Mode

  This option is used to select the USB controlling mode.

* UHCI #X (ports X and X)

  This option is used to enable or disable in the controller mode.

* USB 2.0(EHCI) Support

  This option is used to enable USB2.0.

➢ **PCI Express Root Port X**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Chipset	
PCI Express Port X [Enabled]	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2008,American Megatrends, Inc.	

● **PCI Express Port X**

This option is used to enable or disable the PCIE0-3 ports.

◆ **Boot**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Main Advanced Chipset **Boot** Security Save & Exit	
Boot Configuration Quiet Boot [Disabled] **Boot Option Priorities** Boot Option #1 [Built-in EFI Shell] **Hard Drive BBS Priorities**	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

➢ **Quiet Boot**

Boot mode selection switch, which is used to enable or disable Quiet Boot function.

➢ **Boot Option Priorities**

This option is used to configure the system booting priorities. #1 represents the highest priorities while #n represents the lowest priorities.

➢ **Hard Drive BBS Priorities**

This option is used to configure the priorities of the legacy devices in BBS. #1 represents the highest priorities while #n represents the lowest priorities.

◆ **Security**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Main Advanced Chipset Boot **Security** Save & Exit	
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. Administrator Password User Password	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

➢ **Setup Administrator Password**

This option is used to set administrator password.

Note: If ONLY the Administrator's password is set, then this is only asked for when entering Setup;

◆ **Save & Exit**

Aptio Setup Utility – Copyright (C) 2009 American Megatrends, Inc.	
Main Advanced Chipset Boot Security **Save & Exit**	
Save Changes and Reset Discard Changes and Reset	→←：Select Screen ↑↓：Select Item Enter：Select +/-：Change Opt F1：General Help F2：Previous Values F3：Optimized Defaults F4：Save ESC：Exit
Version 2.00.1201. Copyright (C) 2009,American Megatrends, Inc.	

➢ **Save Changes and Reset**

The option is used to save changes and reset.

➢ **Discard Changes and Reset**

The option is used to discard changes and reset.

System Resource Managed by BIOS under X86 Platform

We define three kinds of system resources here: I/O port address, IRQ interrupt number and DMA number.

◆ **DMA**

Level	Function
DMA0	Unassigned
DMA1	Unassigned
DMA2	Unassigned
DMA3	Unassigned
DMA4	Used for DMAC cascade
DMA5	Unassigned
DMA6	Unassigned
DMA7	Unassigned

◆ **APIC**

Advanced programmable interrupt controller. Most motherboards above P4 level support APIC and provide more than 16 interrupt sources, like IRQ16 - IRQ23; while some others can have up to 28 interrupt sources, such as motherboard supporting PCI-X. However, relevant OS are required to enable that function.

◆ **IO Port Address**

Only 16 IO address lines are designed for X86, from 0 ~ 0FFFFh; there is 64K for the system I/O address space. In traditional ISA connector, only the foregoing 1024 (0000 ~ 03FFh) are adopted while the ports above 0400h are adopted by PCI and EISA connectors. Each peripheral will occupy portion of the space. The table below shows the I/O connectors used in X86 platform.

Address	Device Description
000h – 001Fh	DMA Controller#1
020h - 021h	Programmable Interrupt Controller
040h - 043h	System Timer
060h - 060h	Standard PS/2 Keyboard
064h – 064h	Standard PS/2 Keyboard
070h - 071h	System CMOS/Real Time Clock
081h - 091h	DMA Controller
0A0h – 0A1h	Programmable Interrupt Controller
0C0h – 0DFh	DMA Controller
0F0h – 0FFh	Numeric data processor
2E8h – 2EFh	COM4
2F8h – 2FFh	COM2
3B0h – 3BBh	Intel(R) Graphic Media Accelerator
3C0h – 3DFh	Intel(R) Graphic Media Accelerator
3E8h – 3EFh	COM3
3F8h – 3FFh	COM1
4D0h – 4D1h	Programmable Interrupt Controller
D00h – FFFFh	PCI Bus

◆ **IRQ Assignment Table**

There are 15 interrupt sources of the system. Some are occupied by the system devices. Only the ones that are not occupied can be assigned to other devices. ISA device requests exclusive use of its interrupt. Only the plug and play ISA devices can be assigned by the UEFI or the OS. And several PCI devices share one interrupt, which is assigned by UEFI or OS. Interrupt assignment of some devices of X86 platform is shown in the table below, but it does not show the interrupt source occupied by the PCI devices.

Level	Function
IRQ0	System Timer
IRQ1	Standard 101/102 Key or Microsoft Keyboard
IRQ2	Reserved
IRQ3	COM 2
IRQ4	COM 1
IRQ5	Reserved
IRQ6	Reserved
IRQ7	COM3/4
IRQ8	System CMOS/Real Time Clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	Numeric data processor
IRQ14	Reserved
IRQ15	Reserved

4. Installing the Drivers

Regarding the driver program of this product, please refer to the enclosed CD.

5. Appendix

5.1 BPI Function

EVOC BPI (BIOS Programming Interface) is a cross-platform, easy-to-maintain software interface specification, which supports access to hardware under the Protected Mode of the operating system. The function of the product is to provide a unified standard interface for the application software or driver; therefore, when the hardware of the motherboard is upgraded, there is no need to modify the application software or driver and the former software can operate on the new platform normally. It has greatly sped up the product development and reduced the maintenance cost. Currently, BPI supports the configuration of WDT and GPIO as well as H/W monitor function. As for the test program and function library, please refer to the relevant documents in the enclosed CD.

Features of the BPI include:

1. Platform Irrelevant

   The software developed by BPI function library can operate on a new platform, supporting BPI function, normally without making any modification.

2. Security and High Reliability

   The BPI function library accessing the hardware is programmed by the motherboard developer and is strictly tested; therefore, it can avoid system malfunction caused by improper operation of the system hardware.

3. Flexible Configuration

   Take GPIO configuration as an example, users may conveniently configure an arbitrary GPIO function by BPI function library or test program.

4. Easy Maintenance

   Traditional WDT and GPIO programming are closely related to the hardware with complicated test and debug process and software of different platforms; however, the software developed by BPI only requires one set of the maintenance software.

5. Low Cost

   Developing the applications by BPI will not result in additional hardware and software cost, but it will reduce the development difficulty, development cycle and time-to-market for the system integrator.

5.2 Troubleshooting and Solutions

Common Fault	Issues to be Checked
Unable to bootup after powered on	8. Please make sure whether the power cord is well connected; 9. Please make sure whether the adopted power supply meets the power requirement of the motherboard; 10. Please check whether the CPU has been properly installed and whether the CPU has been buckled properly; 11. Remove and install the memory module again; 12. Replace the memory module; 13. Please clear the CMOS according to the Manual; 14. Please make sure whether there are peripheral cards connected, and whether it is normal after removing the peripheral cards;
BIOS Setup cannot be saved	Please check whether the CMOS battery voltage is lower than 2.8V; if so, replace it with a new battery, set and save the BIOS Setup again.
No bootable device can be found	4. Please make sure the power cable or data cable of the HDD is connected properly; 5. Please check whether there is physical damage to the HDD; 6. Please make sure operating system has been normally installed in the HDD.
Blue screen or computer crush occurred when entering system	4. Please check whether the memory module or the peripheral card is loose; 5. Try to remove the newly installed hardware, uninstall the driver or software; 6. Try to replace the memory module.
Slow to enter operating system	1. Please check whether there are bad tracks on the hard disk by third party software; 2. Please make sure the remaining space on the system partition is enough; 3. Please check whether the CPU fan is operating

	normally.
System reboots automatically	1. Please make sure the CPU fan is operating normally; 2. Please check whether the reset button has been triggered by accident; 3. Please check whether the system is affected by virus using anti-virus software; 4. Please check whether the memory module or the peripheral card is loose; 5. Please make sure the load carrying capability of the adopted power supply is enough; you may try to replace the power.
No USB device can be detected	1. Please confirm whether independent power supply is required on the USB device; 2. Please check whether ill contact exists on the USB port; 3. Please make sure the USB controller in BIOS Setup has been enabled.
No PCI card can be detected	1. Please check whether additional power supply is needed on the PCI card; 2. Please make sure whether the operating voltage of the PCI card is in accord with that supplied by motherboard (5V by default); 3. Please make sure whether the PCI slot can be identified after replacement.
No ISA card can be detected	1. Please make sure the resources used by ISA card have been reserved by BIOS according to the ISA card manual -- there are reserved options in BIOS Setup for ISA to use I/O or memory resource on most of the motherboards; and check whether the IRQ used by ISA card has been reserved in BIOS Setup; 2. The ISA card usually cannot be identified directly under the

	system; please choose “Add Hardware” in the “Control Panel” in Windows system to set.